STATE OF ALASKA

Jay S. Hammond, Governor

Annual Performance Report for

EVALUATION OF INTERIOR WATERS AND SPORT FISH WITH EMPHASIS ON MANAGED LAKES - FAIRBANKS DISTRICT

by

Michael J. Kramer

ALASKA DEPARTMENT OF FISH AND GAME
Ronald O. Skoog, Commissioner

SPORT FISH DIVISION
Rupert E. Andrews, Director

Job No. G-III-H

Page No.

Evaluation of Interior Waters and Sport Fish with Emphasis on Managed Lakes - Fairbanks District

Michael J. Kramer

RESEARCH PROJECT SEGMENT

State:	ALASKA	Name:	Sport Fish Investigations of Alaska
Project No.:	F-9-10		
Study No.:	G-III	Study Title:	LAKE AND STREAM INVESTIGATIONS
Job No.:	G-III-H	Job Title:	Evaluation of Interior Waters and Sport Fish with Emphasis on Managed Lakes - Fairbanks District

ABSTRACT

Late winter dissolved oxygen readings were taken on 19 district lakes in 1977. All managed lakes tested had sufficient dissolved oxygen to overwinter fish. Nineteen lakes were gill net sampled to evaluate species composition and growth. Whitefish, Coregonus spp., population estimates were taken at the Chatanika River where a total of 14,100 fish was counted.

A creel census conducted on the Chatanika River whitefish spearing season in September and October showed a calculated 250 fishermen spent 416 hours to harvest 986 whitefish. Fishery pressure at Birch Lake was calculated at 18,312 angler hours from November 1, 1976 through August 1977.

RECOMMENDATIONS

1. Stocking success of Fairbanks district lakes stocked with rainbow trout, Salmo gairdneri Richardson, silver salmon, Oncorhynchus kisutch Walbaum, or grayling, Thymallus arcticus (Pallas), should be evaluated.

2. Creel census efforts on Birch Lake and other selected high use fisheries should continue.

3. Whitefish population estimates should be conducted in selected segments of the Chatanika River.

4. Further investigation should be made of rehabilitation possibilities for Blair Lake.

OBJECTIVES

1. To assess the environmental characteristics and fish species composition of the waters of the job area and, where practical, obtain estimates of existing or potential angler use and sport fish harvest.

2. To evaluate application of fishery restoration and enhancement measures.

3. To assist as required in the investigation of public access status to the area's recreational fishery waters.

TECHNIQUES USED

Scales used for age determination were cleaned and mounted between glass slides. A Bruning 200 microfiche reader was used to read the scales. All fish were measured for fork length in millimeters. Water samples for dissolved oxygen readings were collected using a Kemmerer water sampler and analysis was done with a Hach Model AL-36-WR kit. Graduated mesh monofilament and multifilament gill nets, 125' x 6' (38 x 1.8 m) with five mesh sizes ranging from 1/2" to 2 1/2" (12-64 mm) bar measure were used to sample fish populations.

Table 1 contains scientific and common names and abbreviations of all fish mentioned in this report.

FINDINGS

Dissolved Oxygen Testing

Nineteen Interior waters were tested for dissolved oxygen content during the reporting period (Table 2).

All lakes currently managed for sport fishing had sufficient oxygen to overwinter fish. Generally, the dissolved oxygen readings were higher in 1977 than in the past several years due to a mild winter which caused less than usual ice thickness. The official Fairbanks temperature never fell below -28°F (-33.3°C) during the winter of 1976-77.

Fish Sampling in District Waters

Nineteen lakes in the Fairbanks district were test netted to determine species composition and stocking success (Table 3). Large landlocked silver salmon were caught in 1976 in Harding Lake (Kramer, 1977) weighing up to 4,387 g (9 3/4 lbs) and ranging in length from 356 mm to 672 mm (14" to 26.5") with an average of 534.5 mm (21").

Large landlocked silver salmon were also caught in Harding Lake during this reporting period, 1977, but the maximum weight was only 3,178 g

Table 1. Scientific and common names of fish mentioned in this report.

Common Name	Scientific Name	Abbreviation
Round whitefish	Prosopium cylindraceum (Pallas)	RWF
Humpback whitefish	Coregonus pidschian (Gmelin)	HWF
Least cisco	Coregonus sardinella Valenciennes	LCI
King salmon	Oncorhynchus tshawytscha (Walbaum)	KS
Chum salmon	Oncorhynchus keta (Walbaum)	CS
Rainbow trout	Salmo gairdneri Richardson	RT
Silver salmon	Oncorhynchus kisutch (Walbaum)	SS
Arctic grayling	Thymallus arcticus (Pallas)	GR
Lake chub	Couesius plumbeus (Agassiz)	LC
Northern pike	Esox lucius Linnaeus	NP
Sheefish	Stenodus leucichthys (Güldenstadt)	SF
Longnose sucker	Catostomus catostomus (Forster)	S
Burbot	Lota lota (Linnaeus)	BB
Lake trout	Salvelinus namaycush (Walbaum)	LT
Ninespine stickleback	Pungitius pungitius (Linnaeus)	NSB

Table 2. Fairbanks area waters tested for dissolved oxygen, 1977.

Water	Date	Ice Depth	Water Depth	Snow Depth	Sample Depth	D.O. ppm
Dune Lake*						
64°25' x 140°53'	3-29	36"	...	12"	5'	3.0
Geskakmina Lake*						
64°37' x 150°15'	3-29	36"	17'	12"	5'	9.0
					10'	7.0
					17'	2.0
Otto Lake	3-29	36"	5'	0"	5'	5.0
Berthold's Pit	4-12	36"	16'	12"	10'	4.0
Eielson AFB Waters:						
Bear Lake	3-21	33"	19'	14"	5'	6.0
					10'	4.0
Grayling Lake*	3-23	35"	13'	11"	5'	1.6
Hidden Lake*	3-22	30"	15'	15"	5'	2.0
Engineer Hill (Lily) Lake*	3-23	34"	8'	12"	5'	8.0
					8'	2.0
Moose Lake						
South half	3-21	36"	21.5'	11"	5'	0
North half	3-22	38"	17'	10"	5'	6.5
					10'	5.0
Mullens Pits						
Large	3-24	32"	12.5'	9"	5'	2.4
Small	3-24	34"	12'	9"	5'	0.8
Pike Lake	3-25	32"	6'	14"	4.5'	0
Rainbow Lake	3-22	31"	7'	13"	5'	1.8
Tar Kettle Lake	3-23	33"	16'	13"	5'	0
Big Twin Lake	3-21	38"	12.5'	6"	5'	0
Little Twin Lake	3-21	38"	19'	10"	5'	0
28 Mile Pit*	3-24	34"	15.5'	10"	5'	9.0
					10'	8.0
338.7 Mile Pit	3-23	33"	12'	13"	5'	1.0
Scout Lake	2-16	30"	13'	10"	5'	5.0
	3-2	32"	13'	11"	5'	5.0
					10'	5.0
					13'	3.0
	3-15	32"	15'	11"	5'	5.0
	3-29	33"	16.5'	13"	5'	4.0
					10'	3.0
	4-18	34"	13'	12"	5'	4.0

* Currently managed waters.

Table 3. Fish sampling summaries, 1977.

Water	Date	Age	Species	No.	Fork Length (mm) Range	Mean	Frequency*
Bathing Beauty Pond	8/30	II	GR	120	125-145	134	5.00
		IV	GR	1		275	0.04
Birch Lake	8/18	0	RT	1		120	0.04
	6/8-10	I	SS	11	127-150	136	Fyke trap
	6/8	II	RT	2	196-234	215	0.08
	6/8-10	II	SS	50	159-235	202	Fyke trap
	8/18	II	RT	2	185-195	190	0.08
	12/1	II	SS	4	260-295	274	Hook & line
	8/18	III	RT	2	270-325	298	0.08
	12/1	III	SS	1			Hook & line
	8/18	V	RT	1		465	0.04
Birch Lake Pit	8/4	II	GR	15	100-125	113	0.63
Grayling Lake	8/3	II	GR	1		240	0.04
		...	NP	1			0.04
Harding Lake	5/25	...	NP	39	140-705	455	0.27
		...	BB	1		700	0.01
	6/10	...	NP	8	437-880	647	0.04
		...	LT	1		730	0.04
		...	BB	1		725	0.04
	8/17	...	NP	38	120-795	445	0.27
	8/18	...	LT	1		725	0.04
	9/30	...	LT	1		736	0.01
	6/10	I	SS	4	125-135	129	0.17
	8/18-19	I	SS	3	190-195	193	0.12
	9/27-30	I	SS	2	209-216	212	0.02
	6/24	II	SS	1		315	0.04
	9/27-30	II	SS	1		423	0.01
	9/27-30	III	SS	19	381-597	500	0.20
Hidden Lake	8/3	II	GR	7	140-155	144	0.29
Johnson Road Pit #1	8/4	I	GR	9	120-145	131	0.38
Johnson Road Pit #2	8/4		NO FISH				

Table 3. (Cont.) Fish sampling summaries, 1977.

Water	Date	Age	Species	No.	Fork Length (mm) Range	Mean	Frequency*
Koole Lake 64°12' x 146°35'	7/7	III	RT	10	277-333	302	Hook & Line
Little Harding	7/11	I	SS	23	120-134	127	Fyke trap
Lost Lake	8/18	...	SF	4	235-250	245	0.08
		...	S	No data			
		...	LC	No data			
Nenana Pond (large)	8/12	II	SS	2	220-230	225	0.08
	9/14	I	SS	23	100-110	105	0.70
		II	SS	17	220-290	258	0.96
		...	GR	2	240-265	252	0.08
		...	S	2	220-240	230	0.08
		...	RWF	1		220	0.04
Nenana Pond (small)	9/14	I	SS	36	100-130	111	1.63
		II	SS	3	220-285	247	0.12
		...	GR	5	240-295	261	0.21
Otto Lake	8/12	...	NP	21	160-680	194	0.44
Roy Lake	6/30	II	SS	1		340	0.25
	11/1-3	II	SS	21	381-457	409	0.29
Sansing Lake	4/5	III	RT	10	185-230	210	0.40
		IV	RT	2	200-235	218	0.08
Steese Highway Pits							
30.6 Mile	8/10	II	GR	11	182-217	207	0.46
34.6 Mile	8/10	II	GR	13	202-230	216	0.54
35.8 Mile	8/10		NO FISH (Pond Winterkilled)				
Wilderness Lake	7/14	...	NP	1			0.007
64°33' x 151°09'		...	NSB	9	37- 48	42.6	Seine
31 Mile Pit	8/5	II	GR	1		270	0.04
	8/30	I	GR	2	125-140	132	0.08
		II	GR	4	195-210	204	0.17

* Fish per hour in 125' graduated mesh gill net.

(7 lbs) and sizes ranged from 381 mm to 597 mm (15" to 23.5") with an average of 500 mm (19.7"). The average weight of the salmon in 1976 was 2,279.3 g (5 lbs) and the average weight of the 1977 catch of salmon was 1,714 g (3.8 lbs).

Age and growth data on 69 Harding Lake least cisco captured incidental to other studies between 1974-1977, are presented in Table 4. All age III and older cisco were sexually mature. Alt (1971) and Kepler and Townsend (1974) found that least cisco in the Minto Flats-Chatanika River complex were also sexually mature at age III; however growth on the Harding Lake least cisco is slower than the Minto Flats-Chatanika River least cisco. Least cisco in Harding Lake are an important prey fish for the larger predatory fish.

Birch Lake was test netted and fyke trapped and information was collected on 11 age I silver salmon and 54 age II silver salmon. Only one age III silver salmon was caught during test fishing. Information was also collected on one age 0 rainbow trout, four age II rainbow trout, two age III rainbow trout and one age V rainbow trout.

Koole Lake was sampled by hook and line and information was collected on 10 age III rainbow trout. These rainbows averaged 302 mm (11.9") and were very abundant in the lake on July 7, 1977. This fishery provides a good fly-in or snowmachine in fishing opportunity. One fish guide reportedly flew in approximately 65 fishermen over the summer months. Numerous private planes also take advantage of this popular trout fishery.

Roy Lake, near Central, Alaska was test netted under the ice on November 1-3, 1977 and 21 age II silver salmon averaging 409 mm (16.1") were captured. This is very rapid growth for landlocked silver salmon. The lake provides the residents of Central and Circle City with a quality sport fishing opportunity.

Wilderness Lake, 64°33' by 151°09', was test netted July 14, 1977 and one northern pike was captured in 144 net hours. Beach seining produced nine ninespine stickleback. This is the first report of stickleback in the Tanana River and the upper Yukon River drainages.

Twelve managed gravel pits were also test netted for age and growth information.

Chatanika River Studies

Population Estimates:

A population estimate of humpback whitefish and least cisco was conducted on the Chatanika River on August 24 by visual count utilizing a platform mounted on the bow of a flat bottomed boat. It has been found (Kramer, 1974) that visual counts of whitefish in this river closely correlate with Schnabel tag and recapture estimates.

Table 4. Age and growth frequency of 69 least cisco captured from Harding Lake, 1974-1977.

Age Class	No.	Weight (g) Range	Weight (g) Mean	Fork Length (mm) Range	Fork Length (mm) Mean	Sexual Condition
II	7	22-60	48	131-182	165	Immature
III	16	40-69	60	162-225	181	Mature
IV	22	54-94	70*	157-230	199	Mature
V	20	101-170	125**	200-265	228	Mature
VI	1		142		228	Mature
VII	1		118		232	Mature
VIII	1		198		276	Mature
XI	1		444		339	Mature

* Weight based on 6 fish
** Weight based on 4 fish

In former years whitefish counts on the Chatanika took place from 19.3 km (12 miles) above the Elliot Highway bridge down to 16 km (10 miles) below the bridge. In 1977 it was only possible to count the lower 16 km (10 miles) due to very low water making boating difficult. An estimated 2,500 humpback whitefish and 11,700 least cisco were counted for a total of 14,100 whitefish. This total compares favorably with past counts (Table 5).

Creel Census

Chatanika River:

A spear fishing season for whitefish in the Tanana River drainage was initiated in 1970 to provide an additional method for the sport fisherman to harvest these desirable fish. A creel census has been taken every fall on the Chatanika River where most of the fishing pressure occurs. A creel census station was set up at the Elliott Highway bridge to count fishermen and their catch. The census was designed to cover 50% of the possible fishing time throughout the period from September 1 to October 16, 1977.

An expansion of the data shows a calculated 250 fishermen spent 416 hours to spear 484 humpback whitefish, 418 least cisco and 84 round whitefish (Table 6). The total harvest (986) is up from the total harvest in 1976 (540) but is down from the record high of 3,032 harvested in 1973. In 1977 the spear fishermen were restricted principally to the area downstream from the Elliott Highway bridge because low water and several channel changes upstream from the bridge make boating difficult. A summary of spearfishing in the Chatanika River from 1972 to 1977 is found in Table 7.

Salcha River:

A limited creel census was taken on the Salcha River king salmon and chum salmon fishery between July 18 and July 26, 1977. Sixty-five people who were contacted had fished 104 hours to catch 10 king salmon. It is estimated that 40-60 king salmon and 20-30 chum salmon were harvested in 1977.

Birch Lake:

Summer - Statistically based angler counts were conducted on Birch Lake in 1977 from May 27 to July 31 (Table 8). Data were expanded to cover the period from May 27 to August 31 to provide a comparison with past angler pressure estimates. The 1977 estimate of 15,683 angler hours from May 27 to August 31 shows a reduction in pressure from the identical time in 1976 when 22,000 angler hours were estimated (Kramer, 1977).

Table 9 presents catch information from a voluntary creel census conducted at the Air Force Recreation area. From this information it is estimated that during the period between May 27 and August 31 there was a minimum of 2,352 rainbow trout and 4,705 silver salmon caught. Only 1,255 rainbow trout and 2,510 silver salmon were kept, however, as many were returned to the lake.

Table 5. Whitefish population estimates for the Chatanika River, 1972-1977.

Location	Year	Date	HWF	LCI	Total
Elliott Highway Bridge to 12 miles (19.3 km) above bridge	1972	8/6-12	5,000	6,000	11,000
	1973	8/17-18	5,000	1,000	6,000
	1974	8/13-17	2,800	1,000	3,800
	1977	8/23	...	...	...
Elliott Highway Bridge to 10 miles (16 km) below bridge	1972	8/6-12	3,000	10,000	13,000
	1973	8/17-18	2,000	11,000	13,000
	1974	8/13-17	1,700	23,600	25,300
	1977	8/24	2,500	11,600	14,100

Table 6. Chatanika River whitefish harvest summary, September 1-October 16, 1977.

	Calculated Totals	
Number of fishermen	250	
Number of angler hours	416	
Total harvest	986	
Fish/angler hour	2.37	
Fish/angler trip	3.9	
Mean hours per angler trip	1.7	
Calculated number of fish harvested by species:		
	Number	%
Humpback whitefish	484	49
Least cisco	418	42
Round whitefish	84	9

Table 7. Chatanika River whitefish harvest summary, 1972-1977.

Year	Date	Angler Hours	Hours Per Trip	Whitefish Per Hour	Total Whitefish Harvested
1972	10/1-16	302	1.7	2.32	701
1973	9/1-10/7	1,356	2.5	2.24	3,032
1974	9/1-10/4	1,054	2.6	1.82	1,924
1976	9/1-10/12	300	2.7	1.80	540
1977	9/1-10/16	416	1.7	2.37	986

Table 8. Birch Lake angler pressure estimates May 27-August 31, 1977.

Month	Weekends and Holidays Estimated Angler Hours	Percent of Total	Weekdays Estimated Angler Hours	Percent of Total	Total
May 27-June 30	5,400	65	2,857	35	8,257
July	2,924	72	1,152	28	4,076
August*	2,016	60	1,334	40	3,350
Totals	10,340	66	5,343	34	15,683

* Information for the period August 1-31 based on the average obtained from July data excluding the holiday period July 1-4. The U.S. Air Force conducted the angler counts but data for August were lost.

Table 9. Birch Lake voluntary creel census (Air Force Recreation Area) May 27-August 31, 1977.

Month	Anglers Censused	Angler Hours	RT Caught	RT Caught and Kept	RT per Angler Hour	SS Caught	SS Caught and Kept	SS per Angler Hour
May	178	499	118	55	0.24	189	96	0.38
June	163	445	52	41	0.12	180	91	0.40
July	126	341	18	5	0.05	25	13	0.07
August	69	181	27	18	0.15	51	32	0.28
Totals	536	1,466	215	119	Mean 0.15	445	232	Mean 0.30

Winter - A weekend creel census was taken at Birch Lake from November 1 through breakup in April. It was estimated that approximately 1,295 anglers fished 2,629 man hours to harvest 1,048 silver salmon and 35 rainbow trout (Table 10). Combining the two estimated catch figures for summer and winter we have an estimated total catch from November 1976 to September 1977 of 3,558 silver salmon and 1,290 rainbow trout.

Lake Stocking

Nine gravel pits and six lakes were stocked in the Fairbanks district during 1977 (Table 11). Arctic grayling were stocked for the first time in five gravel pits along the Steese Highway and in two gravel pits close to the city of Anderson. Engineer Hill Lake on Eielson Air Force Base was also stocked with grayling. This lake was treated with rotenone in 1976 to rid the lake of a lake chub population.

A new gravel pit located at 28 Mile Richardson Highway was stocked with silver salmon after two years of dissolved oxygen testing indicated ample oxygen for overwinter survival.

LITERATURE CITED

Alt, K. T., 1971. A life history study of sheefish and whitefish in Alaska. Alaska Dept. of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress 1970-1971, Project F-9-3, 12(R-II): 31p.

Kepler, P. and A. Townsend. 1974. Population studies of northern pike and whitefish in Minto Flats. Alaska Dept. of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress 1973-1974. Project F-9-6, 15(G-II-J): 59-79.

Kramer, M. J. 1974. Inventory and cataloging of the sport fish and sport fish waters in Interior Alaska. Alaska Dept. of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress, 1973-1974, Project F-9-6, 15(G-I-G): 147-160.

_____. 1975. Inventory and cataloging of Interior Alaska waters - Fairbanks District. Alaska Dept. of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress 1974-1975, Project F-9-7, 16(G-I-G): 145-181.

_____. 1977. Evaluation of Interior Alaska waters and sport fish with emphasis on managed lakes, Fairbanks District. Alaska Dept. of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress 1976-1977, Project F-9-9, 18(G-III-H): 66-86.

Table 10. Winter weekend creel census, Birch Lake 1976-77.

Date	Number of Anglers	SS Harvested	RT Harvested	Estimated Man Hours
Nov	180	80	0	365
Dec	132	58	0	268
Jan	380	62	2	771
Feb	360	60	2	731
Mar	80	176	4	300
Apr	163	612	27	194
Totals	1,295	1,048	35	2,629

Table 11. Lake stocking, Fairbanks District 1977.

Lake	Location	Date	Species	Size	Number
Harding	Richardson Highway	7/19	SS	278/lb	150,500
		8/5	SS	400/lb	212,000
		9/7	SS	154/lb	105,762
Geskakmina	35 miles west of Nenana	6/28	SS	440/lb	75,000
Nenana Pond	Parks Highway	6/30	SS	440/lb	6,000
28 Mile Pit	Richardson Highway	6/30	SS	440/lb	5,500
Lost	Richardson Highway	6/30	SS	440/lb	60,000
Roy	7 miles west of Central	6/30	SS	440/lb	10,000
Birch	Richardson Highway	5/26	RT	120/lb	24,600
		5/31	RT	150/lb	38,100
		5/31	RT	125/lb	5,850
		6/2	RT	141/lb	32,000
		12/22	RT	53/lb	129
		12/22	RT	153/lb	3,570
29.6 Mile Pit	Steese Highway	6/20	GR	Fry	10,000
31.6 Mile Pit	Steese Highway	6/20	GR	Fry	10,000
33.0 Mile Pit	Steese Highway	6/20	GR	Fry	10,000
33.5 Mile Pit	Steese Highway	6/20	GR	Fry	10,000
36.5 Mile Pit	Steese Highway	6/20	GR	Fry	10,000
Engineer Hill	Eielson AFB	6/20	GR	Fry	50,000
Anderson Pit (rectangular)	City of Anderson	6/21	GR	Fry	12,500
Anderson Pit (round)	City of Anderson	6/21	GR	Fry	12,500

_____. 1977. Evaluation of silver salmon stocks in Interior Alaska waters through transplants of smolts from nursery lakes. Alaska Dept. of Fish and Game. Federal Aid in Fish Restoration, Annual Report of Progress 1976-1977, Project F-9-9, 18(G-III-J): 107-115.

Prepared by:

Michael J. Kramer
Fishery Biologist

Approved by:

s/Rupert E. Andrews, Director
Sport Fish Division